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ABSTRACT

Despite recent widespread claims about the importance of early contact for facilitating mother-infant bonding, the effects of early contact have not been convincingly demonstrated. Methodological and procedural difficulties, contributing to a "Hawthorne" effect, may account for the pattern of inconsistent and unclear findings to date. The effects of early contact were examined using methodological features which included random assignment of mothers to infant contact conditions, procedures to minimize the effects of "Specialness" of extra contact mothers, checks to ensure equal staff time with all mothers, and data scores who were blind to group assignment of mothers. Fifteen healthy primiparous mothers had their infants one hour at delivery and ninety minutes at each feeding; fifteen received the usual hospital routine--brief contact at delivery and thirty minutes at each feeding. No differences in maternal behavior were obtained using data from 28 discrete response measures, using pooled indicies of maternal response measures, or assessing maternal responsiveness as a function of infant state. Other factors appear to be more important than early contact--socioeconomic level, prenatal instruction, and social support systems. (Author)

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Mother-Infant Bonding Reconsidered: Some Recent Results

Marilyn Svejda, Joseph Campos and Robert Emde

During the past several years there has been a growing interest in the development of mother to infant attachment. Attachment has been defined by Klaus and Kennell (1976) as a "unique relationship between two people that is specific and endures through time" (p. 2), and has been indexed by specific behaviors such as smiling, talking, kissing, fondling, gazing, and other behaviors which seemingly maintain contact and show affection toward the infant. Recent research has emphasized the importance of contact between mother and infant in the immediate postpartum period as a crucial determinant of the quality of this attachment, thus underscoring the biological basis of the attachment process (deChateau & Wiberg, 1977a; Hales, Lozoff, Sosa & Kennell, 1977; Klaus, Jerauld, Kreger, McAlpine, Steffa & Kennell, 1972). Attachment, according to this framework, has been conceptualized as a phenomenon that, once set in motion, is relatively impervious to alteration or deviation--hence the term "bonding." In addition, maternal attachment has been found to be most effectively established in the time interval shortly after birth--the maternal "sensitive period." The effects of early contact in the "sensitive period" have been shown to last well into the first year (deChateau & Wiberg, 1977b; Kennell, Jerauld, Wolfe, Chesler, Kreger, McAlpine, Steffa & Klaus, 1974) and probably beyond (Klaus & Kennell, 1976; Ringler, Trause, Klaus & Kennell, 1978).

Several studies claim to demonstrate that early mother to infant attachment is facilitated by early contact (Carlsson, Fagerberg, Horneman, Hwang, Larsson, Rodholm, Schaller, Danielsson & Gundewall, 1978; deChateau & Wiberg, 1977a; Hales, Lozoff, Sosa & Kennell, 1977; Klaus, Jerauld, Kreger, McAlpine, Steffa & Kennell, 1972). A careful review of the various studies indicates that the effects of early contact have not been convincingly demonstrated. (Slide One) Four issues

will be addressed in this regard. First, the effects are inconsistent across studies. Second, some effects yield to alternate explanations aside from attachment. Third, the effects are subtle. Fourth, some effects are inconsistent with bonding theory.

Different effects have been reported even when similar dependent measures and paradigms were used. In a study by Klaus and associates (1972) primiparous mothers who had early and extended contact (1 hour after delivery and 3 hours each day for 5 days) with their infants during the postpartum period engaged significantly more in face and fondling behavior at 1 month than did mothers who did not have this kind and amount of contact. Hales and associates (1977) also found significant differences in maternal affectionate behavior at 36 hours between primiparous mothers who received 45 minutes of skin to skin contact with their infants immediately after delivery and mothers who received their infants for the first time at 12 hours for feeding. However, deChateau and Wiberg (1977a), using similar behavioral measures, found no significant differences in affectionate behaviors between primiparous mothers who received their infants on the delivery table for 15 to 20 minutes of skin to skin contact with the initiation of breast feeding and primiparous mothers who received the usual post-delivery routine--having the infant in a crib at the mother's bedside. Finally, while Carlsson et al. (1978) found that early contact mothers smiled and talked more to their infants and held them closer during the first 4 days postpartum than did routine care mothers, a 6 week follow-up study showed that these early differences had entirely disappeared (Carlsson, Fagerberg, Horneman, Hwang, Larsson, Rodholm, Schaller, Danielson, & Gundewall, Infant and Behavior Development, in press).

Some effects yield to alternate interpretation aside from attachment. In one study (deChateau & Wiberg, 1977a) primiparous mothers who received their

infants on the delivery table for 15 to 20 minutes of skin to skin contact and breast feeding were sitting up more and holding their infants more whereas mothers who did not receive early contact were more often lying down and leaning on one elbow at the 36 hour observation. The interpretation of these positional behaviors as indicies of maternal attachment is not clear. Although it can be argued that attached mothers are more likely to sit up in order to hold their infants, why did not other, more direct, indices of the construct (e.g., smiling at the infant) also differentiate early contact from late contact mothers?

The effects of early contact are subtle. For example, Klaus et al. (1972) obtained marginally significant differences between groups of mothers only when several behaviors were combined. In addition, several studies have shown that some maternal behaviors are not affected by early contact. Proximity-maintaining (e.g., holding the infant close) and caretaking (e.g., diapering) behaviors are not different between mothers who experience different contact conditions (deChateau & Wiberg, 1977a; Hales, Lozoff, Sosa & Kennell, 1977; Klaus, Jerauld, Kreger, McAlpine, Steffa & Kennell, 1972).

Finally, some effects are not easily explained by bonding theory. The data from the Hales et al. study (1977) is a case in point. Mothers who received their infants at birth for 45 minutes of skin to skin contact (early contact) engaged in more affectionate behaviors at 36 hours than did mothers who received their infants for the first time at 12 hours for feeding (control). However, a time delay of 12 hours coupled with 45 minutes of skin to skin contact did not affect maternal attachment behavior.

In view of the practical importance of maternal attachment and the inconsistent and unclear findings to date, the present study was designed to investigate the effects of enhanced contact on maternal behavior. The hypothesis was that early contact mothers will demonstrate more attachment behaviors than mothers not having this contact.

Method

Subjects

Criteria. Mothers and infants in the present study met the following criteria: mothers (a) were primiparous, having no prior history of abortion or miscarriage, (b) were between the ages of 16 and 30 years of age, (c) had no illnesses or complications during pregnancy, and (d) were planning to breast feed their infants. Infants (2) were full term, (b) had Apgar scores (Apgar, 1953) between 7 and 10 at 1 and 5 minutes after birth, (c) had no neonatal asphyxia, disease or infection at the time of birth or during the postpartum period, and (d) had no congenital malformations. (Slide Two)

Selection. Mothers who met the initial criteria upon admission to the delivery suite were asked to participate in "a study about mothers and newborn babies." Thirty mother-infant pairs constituted the sample.

Mothers were randomly assigned to one of two infant contact groups. Mothers in both groups were comparable in age, marital status, level of education, and duration of labor. There were no differences between groups in attendance at prenatal classes. All deliveries were uncomplicated vaginal deliveries. While we hoped to get mothers who did not receive any analgesia or sedative medication within the two hour interval prior to delivery, five mothers (four routine care and one extra contact) received minimal to moderate doses of analgesia.

Fathers in both groups were comparable in age, education level, and number present during the delivery. Infants were comparable for sex, birth weight, and gestational age.

Procedure. (Slide Three) Mothers in the routine care group followed the usual hospital routine for newly delivered mothers. They were able to see their infants who remained in the crib in the delivery room. Mothers were given their infants to hold briefly while being wheeled from the delivery room (about 5 minutes' contact). Infants were left at the nursery to be returned to their mothers

4 to 6 hours later for the first feeding. Infants stayed with their mothers for approximately 30 minutes at each feeding. Mothers in the extra contact group received their infants on the delivery table after the episiotomy repair, approximately 25 minutes after the birth for a 15 minute period of skin to skin contact. They had their infants for an additional 45 minutes of contact as soon as they returned to their rooms. The infants were then retained to the nursery. Extra contact mothers received their infants every 4 hours thereafter for breast feeding. At each feeding these mothers had their infants one hour longer than the usual feeding interval of 30 minutes, for a total of 90 minutes. Thus, in the first 36 postpartum hours extra contact mothers had approximately 10 additional contact hours with their infants including the one hour at delivery. Because nurses might have been inclined to spend more time with extra contact mothers when their infants were with them, inadvertently contributing to a feeling of "specialness," spot checks were done on the amount of time spent with the dyads. These checks revealed that nurses spent an equal amount of time with all study mothers when mothers and infants were together. Mothers who were not in the study but who shared a room with extra contact mothers had their infants longer at each feeding in order to minimize the apparent differences in contact time between study mothers and other mothers.

Observation. All mothers and infants were videotaped about 36 hours after delivery. The observation period was divided into two segments--a 10 minute interaction and a breast feeding. (Slide Four) Twenty eight behavior items were scored, 16 during the interaction period and 12 during the feeding. Infant state was scored for each interval during the 10 minute interaction and at the beginning and end of the breast feeding period. The infant states scored were asleep, active awake, quiet awake, drowsy, and crying.

Results

The data were analyzed in two ways. (Slides 5-6) In one, the 28 discrete behaviors were separately tested using point biserial correlation. In the second, behaviors were grouped into affectionate, proximity-maintaining, caretaking, and "other directed" categories and also tested using point biserial correlation. No significant correlations were obtained between discreet maternal behaviors and type of infant contact in either the 10 minute interaction or the breast feeding observation. Similarly, no significant correlations were obtained between any of the behavior categories and type of infant contact.

The hypothesis was not supported. Enhanced infant contact did not seem to be a significant factor in determining type or quality of maternal attachment behavior to the infant. Moreover, analysis of the data of routine care mothers indicated that they manifested many attachment behaviors, for example, high frequencies of touching, looking, smiling, talking, and cradeling.

Discussion

Our findings are different from those reported previously on maternal attachment to her infant. Mothers in both groups were attached yet extended contact did not facilitate attachment as had been reported by Klaus et al. (1972) and others (Carlsson, Fagerberg, Horneman, Hwang, Larsson, Rodholm, Schaller, Danielsson & Gundewall, 1978; deChateau & Wiberg, 1977a; Hales, Lozoff, Sosa & Kennell, 1977). How does one account for the presence of attachment in both groups? Many factors may play a role. (Slide 7) A few will be discussed. One such factor is the set of variables associated with a more economically advantaged population, for example, job, income, and education. These variables may affect maternal responsiveness to her infant as has been shown by Leiderman and Seashore (1975). They found that higher class mothers provided more attention to their infants while lower class mothers smiled less at them. In contrast to previous studies, the sample in our study came largely from the working class

(blue collar) population, were high school educated, and were married. In addition, many of these mothers were under the care of a private physician. This population is decidedly different from the unwed, lesser educated, inner city, urban minority populating constituting the sample in the Klaus et al. study (1972).

Another factor which may enhance the development of maternal attachment behaviors is attendance at prenatal classes. The information provided in these classes may serve to alter the mother's perception of herself as a mother and caregiver thereby affecting subsequent behavior with her infant. Nearly all mothers in our study were enrolled in these classes.

The existence of support systems may also play a significant role in facilitating maternal responsiveness to her infant. Mothers in our study came from stable homes and marriages, had immediate family members, friends, nurses, and physicians readily available for advice and assistance. Especially important is the father's presence in the delivery room. Wilson (1977) found that a significant predictor for the mother's responsiveness in the delivery room (e.g., attempt to reach baby, visual tracking of baby, looking at, talking to, and touching the baby) was the father's general responsiveness, and that maternal responsiveness in the delivery room significantly predicted maternal responsiveness (e.g., quality and frequency of auditory, visual, and tactile stimulation, general sensitivity to infant state) during a hospital feeding. Thus, it is quite possible that maternal responsiveness to her infant could ultimately be affected by the presence of the father at delivery and the support he provides. In our study almost all fathers attended the birth. While no formal measures of father responsiveness were obtained, general observation indicated that they were excited and happy. The support emanating from these many resources may affect the mother's attitudes and perceptions of herself and her infant such that her behavior toward her infant becomes more specific to his/her signals and

needs. A finding from factor analysis of our data suggests that social support systems may indeed be very important. Mothers smiled much more at awake infants when other individuals were present than they did when alone.

In summary, the results of the present study provide no support for the effect of early contact on maternal behavior. It seems that research on mother to infant attachment may be focusing on the wrong variable. It is not contact per se that is important, but rather variables associated with contact, for example, socioeconomic level, availability of support systems, and the social environment provided by nurses, physicians, and family members.

In addition, the results of the present study suggest that there may be reason to be cautious about the way in which research findings on maternal attachment are applied to patient care and interpreted to families. Maternal bonding, exemplified by early contact, is an appealing notion and this particular quality has encouraged health care professionals to accept the notion as Veridical. It seems important that persons in the health care delivery system not confuse a patient advocacy issue with a maternal bonding issue. That is, mothers and infants should be together after birth since there are few medical reasons that would prohibit such contact, and parents experience great joy from this contact (patient advocacy). This is quite different from the notion that early contact is the direct route to maternal attachment.

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Slide 1

Subject Criteria

Mothers

1. primiparous, no history of abortion or miscarriage
2. between the ages of 16 and 30 years
3. no illnesses or complications during pregnancy
4. breast feeding their infants

Infants

1. fullterm
2. Apgar scores between 7 and 10 at 1 and 5 minutes after birth
3. no neonatal asphyxia, disease or infection at birth or during postpartum period
4. no cogental malformations

Slide 2

Major Issues Regarding Early Infant Contact

The effects of early contact

1. are inconsistent across studies
2. yield to alternate interpretations aside from attachment
3. are subtle
4. are in some instances inconsistent with bonding theory

Slide 3

Behavior Measures

10 Minute Interaction

Touches
Hugs
Kisses
Looks at
Smiles at
Talks to
En faces
Rocks
Comforts when cries
Jiggles
Cradles
Props infant against legs
Lies infant across legs
Props infant on shoulder
Talks to others
Looks at others

Breast Feeding

Touches
Looks at
Smiles at
Talks to
Rocks
Jiggles
Burps
Stimulates to suck
Nipple in/out
Talks to others
Looks at others
Smiles at others

Slide 4

Study Design

Routine Care Mothers

1. shown infant; infant remained in crib in delivery room
2. held infant briefly upon leaving delivery room
3. received infant for first time 4-6 hours later; had infant 30 minutes each feeding

Extra Contact Mothers

1. 15 minutes skin to skin contact on delivery table
2. 45 minutes additional contact in mother's room
3. had infant for 90 minutes each feeding

Slide 5

Behavior Measures and Means

Measures	Means	
10 Minute Interaction	Extra Contact	Routine Care
Touches	8.67	9.07
Hugs	0.33	0.13
Kisses	0.13	0.27
Looks at	13.73	13.60
Smiles at	4.67	5.47
Talks to	4.93	4.60
En faces	1.60	1.07
Rocks	3.00	1.13
Comforts when cries	2.07	2.20
Jiggles	2.00	0.53
Cradles	9.87	10.53
Props against legs	1.20	0.53
Lies across legs	0.53	0.40
Props on shoulder	1.07	1.00
Talks to others	0.40	0.80
Looks at others	1.80	1.60

Slide 6

Behavior Measures and Means

Measures	Means	
Breast Feeding	Extra Contact	Routine Care
Touches	8.20	6.47
Looks at	19.87	19.67
Smiles at	2.47	3.87
Talks to	6.40	5.33
Rocks	1.60	1.53
Jiggles	2.73	0.73
Burps	1.53	1.20
Stimulates to suck	2.87	3.60
Nipple in/out	0.47	1.20
Talks to others	1.20	0.87
Looks at others	2.20	1.60
Smiles at others	1.00	0.87

Slide 7

Possible Factors Playing a Role in Maternal Attachment

1. Socioeconomic level
   a. job
   b. income
   c. education
2. Prenatal education
3. Social support systems
   a. husband
   b. family
   c. friends
   d. nurses, physicians